Healthy Aging through Healthy Living

Towards a comprehensive policy and planning framework for Seniors in B.C.

a discussion paper

DOC
BC
H4
D:H438
2005
c.3

BRITISH COLUMBIA
Ministry of Health

NOV 2 9 2005

Copies of this report are available from:

British Columbia Ministry of Health
Healthy Children, Women and Seniors Branch
Population Health and Wellness Division
www.healthservices.gov.bc.ca/cpa/publications/index.html

2005

Acknowledgements

Sincere thanks are extended to the many people who contributed to the development of this discussion paper. In particular, Tessa Graham, Donelda Eve, Matt Herman and other staff from the Population Health and Wellness Division and co-op students Melanie Golder and Véronique Mercier, who played a unique role in the development of this document.

Library and Archives Canada Cataloguing in Publication Data

British Columbia. Ministry of Health.
Healthy aging through healthy living: towards a comprehensive policy and planning framework for seniors in B.C.: a discussion paper.

Available also on the Internet.
Includes bibliographical references: p.
ISBN 0-7726-5461-1

1. Older people - Health and hygiene - British Columbia. 2. Older people - Government policy - British Columbia. 3. Health promotion - British Columbia. I. Title.

HQ1064.C3B74 2005 362.6'09711 C2005-960239-2

LEGISLATIVE LIBRARY OF BRITISH COLUMBIA
3 3298 00324 1503
106-03132/

Contents

Executive Summary 3

Introduction 5

Purpose of this Paper 6

Our Changing Community 7
- Population Projections 7
- Seniors in Health Authorities 8
- Cultural Shifts 9
- The Feminization of Aging 9
- Aboriginal Seniors 10

Seniors' Health System Utilization 11

Components of Healthy Aging 12
- The components of Healthy Aging 12
- Key Issues for Healthy Aging 13

Healthy Aging in B.C.: A Blueprint for Action 15
- Strategies for Health Aging 15
- Spheres of Influence 15
- A Population Health Approach 16
- Principles 17

Integration within Strategic Developments 18
- Strategic Redesign 18
- ActNow BC 19
- Health and Aging Framework 20

Moving Forward: A Partnership Approach 22
- Ministry of Health Stewardship Role 22
- Partnership Approach 22

Ownership, Measures and Targets 23

Conclusion 24

Appendix A: Healthy Eating Evidence 25
Appendix B: Injury Prevention Evidence 30
Appendix C: Physical Activity Evidence 33
Appendix D: Tobacco Cessation Evidence 36
Appendix E: Social Connectedness Evidence 40

References 43

Executive Summary

British Columbia has one of the most rapidly aging populations in Canada. By 2031, 24 percent of British Columbia's population will be over the age of 65. In 2002, B.C. seniors accounted for 50 percent of PharmaCare expenditures, 37 percent of all hospitalized cases and 55 percent of hospital inpatient days (B.C. Ministry of Health Services, 2004). Encouraging healthy lifestyles can prevent, minimize or even reverse frailty and poor health in older age resulting in savings to the health care system and better quality of life for seniors.

Healthy Aging through Healthy Living provides a blueprint that promotes, supports and enables healthy aging for B.C. seniors. It provides an evidence based framework for a comprehensive approach and establishes the Ministry of Health's strategic platform for healthy aging in the context of:

- The four domains for a continuum of health care as identified within the Ministry of Health Service Plan (B.C. Ministry of Health, 2005a).
- Health and Aging Framework as a result from "From Dialogue to Action: Summary Report of the Working Group and Framework for Change" (B.C. Ministry of Health, 2005a).
- ActNow BC, the B.C. Government's cross ministry, partnership based, community focused health promotion platform that helps British Columbians make healthier lifestyle choices to reduce tobacco use, improve nutrition, increase physical activity, and promote healthy choices during pregnancy.

The development of *Healthy Aging through Healthy Living* has the potential to reduce the demand for health care services and reduce health care costs associated with a rapidly aging population. This document provides an overview and evidence to support five key priority issues that researchers have identified as crucial to healthy aging, namely:

- **Healthy Eating -** Healthy eating is critical for seniors to remain independent, maintain their quality of life, and reduce the risk of developing chronic conditions such as high blood pressure, heart disease, respiratory diseases, and some cancers.

- **Injury Prevention -** Unintentional injuries (e.g. falls) involve expensive costs to the health care system as well as serious consequences to seniors themselves. By identifying the risk factors association with unintentional injuries and implementing preventive intervention strategies, it is possible to eliminate or minimize their impact.

- **Physical Activity -** Physical activity brings multiple benefits and significantly contributes to healthy aging. Physical inactivity is associated with premature death, chronic diseases, illness and disability, as well as reduced quality of life and independence.

- **Tobacco Cessation –** Tobacco use is the number one preventable cause of death and disease in Canada. Tobacco use is very costly to the health care system, with most of the cost attributed hospital care. Since many benefits of tobacco cessation happen shortly after quitting, potential short-term economic benefits are likely to be seen with tobacco cessation strategies targeting seniors.

- **Social Connectedness -** Social support contributes to higher quality of life, increased life satisfaction and enhanced mental and physical well being, while social isolation is associated with higher levels of depression and disability associated with chronic diseases, increased rates of premature death, and decreased overall well being.

The development of *Healthy Aging through Healthy Living* is an important component to fulfill the Ministry of Health's goal *to improved health and wellness for British Columbians*. Also, to prevent overcrowded hospitals and longer waiting lists for services, it is crucial for government to change its focus from an acute care model to a "health care" model with an increased emphasis on prevention (The Legislative Assembly of British Columbia, 2004).

Healthy Aging through Healthy Living will also help achieve two of the five "Great Goals for a Golden Decade," namely:

Goal Two	*Lead the way in North America in healthy living and physical fitness.*
Goal Three	*Build the best system of support in Canada for persons with disabilities, special needs, children at risk, and seniors.*

In addition to helping sustain the health care system, implementing a healthy aging strategy will result in healthier, more active and productive seniors. To achieve these results, the B.C. Government will need the sustained efforts and participation of multiple stakeholders, including the health authorities and seniors' organizations. Finally, achieving healthy aging through lifestyle changes will come from a complex, long term and meaningful process that will empower seniors to make healthy choices to improve their health in safe environments where the design and social aspects encourage participation.

Introduction

Health Canada defines healthy aging as "a lifelong process of optimizing opportunities for improving and preserving health and physical, social and mental wellness, independence, quality of life and enhancing successful life-course transitions" (Health Canada, 2002a).

British Columbia (B.C.) has one of the most rapidly aging populations in Canada. By 2031, it is estimated that 24 percent of B.C.'s population will be over the age of 65 (BC Stats, 2005). Many seniors in B.C. have more than one chronic condition with older seniors being more likely than younger seniors to have multiple chronic conditions (B.C. Ministry of Health Services, 2004). It is important to remember, however, that chronic disease, disability and loss of independence are not inevitable consequences of aging: many seniors retain good health, maintain their independence and quality of life, and contribute greatly to their families and communities. In the face of rapid population aging it is therefore clearly of great importance to consider what factors facilitate or impede healthy aging, to ensue that policies and services can be put in place that ensure that all B.C. seniors have an equitable chance of attaining a healthy old age. Achieving equitable healthy aging will not only benefit individuals but also B.C. society as a whole.

Research has shown that healthy lifestyles are more influential than genetic factors in helping seniors avoid the deterioration traditionally associated with aging. Interestingly, only about 30 percent of aging can be explained by biology and genetic endowment (National Advisory Council on Aging, 2004a). People who are physically active, eat a healthy diet, do not use tobacco, and practice other healthy behaviours reduce their risk for chronic diseases and have a much reduced rate of disability compared to those who do not. Having people engage in healthy lifestyles can prevent, minimize or even reverse frailty and poor health in old age (Lemme, 1999; Health Canada, 2002a).

Many British Columbian seniors engage in multiple lifestyle behaviours that are harmful to their health. Physical inactivity, inadequate diet, and the use of tobacco are all examples of common unhealthy lifestyle choices in our society. Over time, these behaviours negatively impact the aging process.

"British Columbia is creating a new care system that values and honors seniors. If we as British Columbians, are to benefit from the tremendous wealth of knowledge and life experience seniors have to contribute, we must ensure they have ways to remain active, independent, and respected members of our communities." (B.C. Ministry of Health, 2005a).

Purpose of this Paper

The purpose of this paper is to set the context to initiate planning with health authorities and other key stakeholders to address healthy aging for seniors in B.C. While the projected demographic changes present a long-term challenge to B.C., the costs of our aging society are manageable, provided appropriate policy responses are made now and over the coming years. There is a need for a coordinated and holistic policy and planning framework to optimize the opportunities and meet the challenges that are presented by our aging population. The development of such a framework is fundamental to a shift in strategic direction that truly addresses the needs of seniors and reinforces the Government's commitment to promote and maintain the health of British Columbian seniors.

An opportunity exists to position a healthy aging framework within other high profile strategic developments. The Ministry of Health has a vision of a modern health system that supports British Columbians across their life span, whether they need support to stay healthy, get better from an illness or injury, live with and manage a chronic disease or disability, or cope with the end of life (B.C. Ministry of Health, 2005b). These four domains have been adopted as the continuum of health care for the future in B.C.

Healthy Aging through Healthy Living would also be aligned to ActNow BC and will be part of the larger proposal for a Provincial Health and Aging Framework. ActNow BC aims to position the province as one of the healthiest jurisdictions to host the Olympic and Paralympic Games. *Healthy Aging through Healthy Living* will be integrated within ActNow BC's ambitious agenda to provide a framework for healthy aging in B.C. These proposed linkages are discussed further later in this document.

Healthy Aging through Healthy Living will also help achieve two of the five "Great Goals for a Golden Decade," namely:

Goal Two	*Lead the way in North America in healthy living and physical fitness.*
Goal Three	*Build the best system of support in Canada for persons with disabilities, special needs, children at risk, and seniors.*

The development of a healthy aging framework would provide the catalyst to stimulate collaborative action that promotes, supports and enables healthy aging for B.C. seniors. This paper starts to present the evidence that will lead to the development of an evidence-based framework for a comprehensive approach, and establishes the Ministry's strategic platform for healthy aging in the context of health redesign.

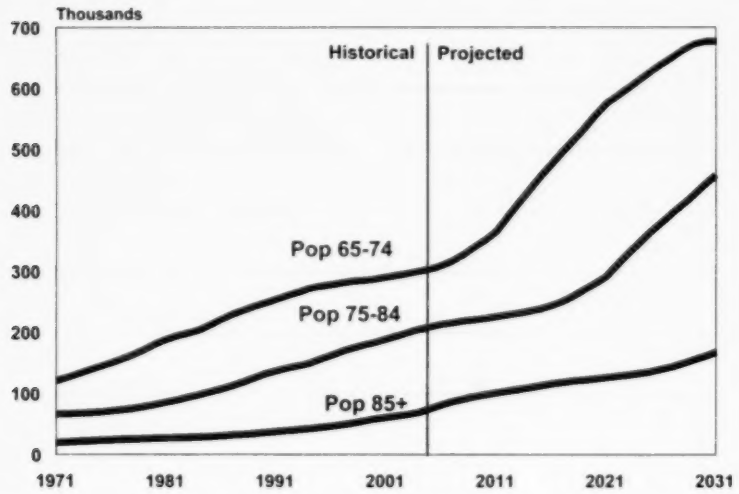
Our Changing Community

Seniors are a significant proportion of the population of B.C., and although they share many similar issues and characteristics, they are a heterogeneous population. Seniors vary not only by age and gender, but also by where they live in the province, ethnicity, heritage, income and marital status (B.C. Ministry of Health Services, 2004).

Population Projections

The population of B.C. is getting older. Between 1995 and 2004, the number of seniors increased from 475,300 to 574,400 – an increase of 21 percent. During this same time period, the proportion of seniors relative to the total population grew by 8.7 percent. From 2004 to 2010, the total number of seniors is expected to grow by another 17 percent to 672,000, and the proportion of seniors relative to the total population will grow by 9.5 percent (BC Stats, 2005). Furthermore, within the senior group itself, the proportion of older seniors (those aged 85 years or older) relative to the total number of seniors has been increasing faster than the proportion of younger seniors and this trend is expected to continue (Figure 1). Between 2001 and 2021 the average age of British Columbians will increase from 38.2 years to 42.6 years (B.C. Ministry of Health, 2005c).

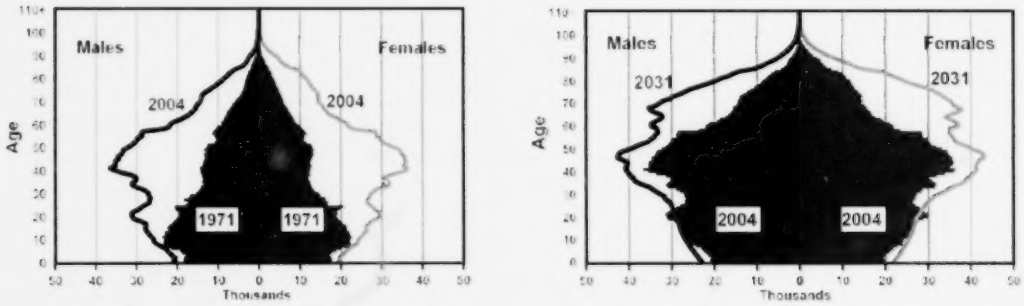
Figure 1. Population of British Columbia by Select Age Groups (65 to 74, 75 to 84 and 85+).



Source: (BC Stats, 2005).

Population pyramids show both size and age distribution of the population, highlighting the "population bulge" (Baby Boomers[1]) – the age of the greatest number of residents. B.C.'s population pyramids for 1971, 2004 and 2031 (see Figure 2) show the population steadily increasing. In 2011, the first wave of the baby boomers will reach 65 years of age.

Figure 2. British Columbia Population Pyramids for Years 1971, 2004 and 2031.



Source: (Forecast 04/12, BC Stats)

Seniors in Health Authorities

The percentage increases in the proportionate number of seniors within each of the B.C. health authorities over a 10-year period from 2004 to 2014 is presented in Table 1.

Table 1. Senior Population Percentage of Total Population within each B.C. Health Authority for Years 2004 and 2014.

	Seniors (65+ years) Population Percentage of Total Population	
	2004	**2014**
Interior Health Authority	16.9%	18.9%
Fraser Health Authority	12.5%	15.3%
Vancouver Coastal Health Authority	12.6%	14.5%
Vancouver Island Health Authority	16.8%	18.9%
Northern Health Authority	8.4%	11.7%
All British Columbia	**13.7%**	**16.0%**

Source: (B.C. Ministry of Health Planning, 2003a)

[1] The population cohort born between 1946 and 1964, a period with a higher than normal total fertility rate. The boom for B.C. is considered to start just after WWII and finish after 1963/1964, when the age specific fertility rates for the 20-24 and 25-29 year old women declined dramatically (the total fertility rate peaked in 1957). There has been no significant 'baby-boom-echo' - a large increase in births - from this group.

Cultural Shifts

Canada's population is not only aging, it is also becoming increasingly diverse. More than 200 ethnic groups were reported in the 2001 Census (National Advisory Council on Aging, 2005). In 2001, visible minorities[1] made up 12.3 percent of the senior population in B.C., compared to the Canadian average of 6.6 percent (B.C. Ministry of Health Services, 2004). Because of changing immigration patterns, immigrant provenance has shifted from Europe to Asia, Africa and the Middle East. The result is that B.C. now has a population made up of very diverse cultures, religions and languages. In 2001, immigrants made up 36 percent of the total senior population in B.C. (B.C. Ministry of Health Services, 2004).

Culture is a determinant of health. One's own cultural values may influence perceptions of health and illness, health practices, behaviours, decisions to consult with a health provider and even how one perceives the seriousness of a health condition. Health is also influenced by the values of the society in which we live. Values shape the attitudes that contribute to stigmatization, loss or devaluation of language and culture and lack of access to culturally appropriate health care and services.

Yet for the most part, aging-related programs and policies continue to treat the seniors' population as a homogenous group and the variety of needs, concerns and histories of ethno-cultural minority seniors often go unrecognized. In developing policies and programs for seniors, ethnic and cultural diversity should to be taken into account. One of the recommendations for health and health care from the National Advisory Council on Aging (2005) is that "governments, universities, colleges and/or health facilities and agencies should support health promotion and the development and dissemination of other physical and mental health resources, programs and services that are linguistically and culturally specific."

The Feminization of Aging

By the year 2010, it is projected that in B.C. 16 percent of all women will be 65 or over. As well, the proportion of women in the oldest categories is expected to increase rapidly in the next few years partly because, on average, women live longer than men. Today it is estimated that there are about 121 women for every 100 men over the age of 65 in B.C., and 197 women for every 100 men aged 85 and over (BC Stats, 2005). In 2004, senior women represented 55 percent of the B.C. senior population (BC Stats, 2005).

While women have the advantage in length of life, they are more likely than men to experience domestic violence and discrimination in access to education, income, food, meaningful work, health care, inheritances, social security measures and political power. These cumulative disadvantages mean that women are more likely than men to be poor and to suffer disabilities in older age (WHO, 2002).

Because of women's longer life expectancy and the tendency of men to marry younger women and to remarry if their spouses die, female widows dramatically outnumber male widowers (WHO, 2002). In 2001, 36 percent of B.C. men aged 85 and older were

---

[1] Used in Census information to refer to the visible minority group to which the respondent belongs. The Employment Equity Act defines visible minorities as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour".

widowers compared to 78 percent of women of the same age (B.C. Ministry of Health Services, 2004). Older women are more likely to live alone, with inadequate social and material supports in their aging years (WHO, 2002). Planning for healthy aging in B.C. will need to reflect this gender imbalance that occurs in the later years.

Aboriginal Seniors

In 2001 there were 7,240 Aboriginal seniors in B.C. Aboriginal seniors comprised 4 percent of the total Aboriginal population compared to non-Aboriginal seniors who comprised 13.3 percent of the total non-Aboriginal population. Three-quarters of the Aboriginal seniors selected as North American Indian as their ethnic origin, and one-fifth identified themselves as Métis (B.C. Ministry of Health Services, 2004).

Aboriginal seniors also have a shorter life expectancy than non-Aboriginal seniors. Status Indian women can expect to live 75.4 years as compared to 82.5 years for non-Status Aboriginal women and 86.4 years for non-Aboriginal women. Likewise, the life expectancy for Status Indian men is 69.9 years and 77.9 years for non-Status Aboriginal men and 83.2 years for non-Aboriginal men (B.C. Ministry of Health Services, 2004).

Effective healthy aging policies aim to affirm values and strengthen the capabilities of Aboriginal seniors. The premature aging and death of Aboriginal people represent a particular challenge to the community.

Seniors' Health System Utilization

One of the demographic trends that is most frequently discussed and debated by health service planners is the aging of the 'baby boomer' generation. This large group is expected to impact both the volume and type of services required.

A significant amount of research exists on the effect the baby boomer generation will have on health services (Broemeling, 2004, Guralnik et al., 2002). Impacts include increasing health care costs, increasing demand for choice and options in health care by a population of informed consumers, increasing need for chronic disease management, and changing patterns of demand for health services by a population expected to live longer lives than the previous generations. In 2002, B.C. seniors accounted for 50 percent of PharmaCare expenditures, 36.5 percent of all hospitalized cases and 55 percent of hospital inpatient days (B.C. Ministry of Health Services, 2004).

An alternative perspective on the baby boom holds that seniors of the future will be healthier than their predecessors. Added to this, improvements in health care such as earlier, more effective intervention for chronic disease and less invasive therapies will reduce the rate of health care use, with potential for little or no net increase in health care demand as baby boomers become seniors (B.C. Ministry of Health Planning, 2003a).

There is no clear consensus on which of these two possible futures is more likely, or whether each may play out to varying degrees in different areas throughout B.C. Therefore, health care leaders and planners must continue to monitor these trends. Since the projections for health services rely on the demand and supply of services, it is important to consider both factors when looking at the impact of B.C.'s aging population on the health care system. Specifically, the health state and health habits of a population characterize demand for health services. For example, the loss of independence associated with disability, chronic illnesses, and co-morbidity usually result in higher utilization of health services and in substantial financial implications for a population (Broemeling, 2004, Guralnik et al., 2002). Alternatively, improved lifestyle delays and minimizes the severity of chronic diseases associated with disability in later life, saves medical costs, and reduces long-term care needs (Laditka, 2001).

Components of Healthy Aging

Health Canada defines healthy aging as "a lifelong process of optimizing opportunities for improving and preserving health and physical, social and mental wellness, independence, quality of life and enhancing successful life-course transitions" (Health Canada, 2002a).

The importance of a proactive and preventative approach to the health of seniors is unequivocal. If it is presumed that aging inevitably accompanies a decline in health then it can easily lead to the adoption of a disease management approach rather than a population health approach that will embrace proactive intervention to improve all aspects of health for seniors. From a World Health Organization perspective, a healt' aging approach is one that considers people of all ages' ability to be able to live a healthy, safe and socially inclusive lifestyle within the physical, social and economic fabric of society (WHO, 2002).

Healthy seniors continue to contribute their skills, knowledge and experience to society. Contrary to the common notion that older age is a time of retirement and withdrawal from society, we are moving to a time where people have positive attitudes toward aging with expectations of continuing productivity and involvement in society. Research shows that engaging in healthy behaviours and receiving social support are, for most people, critical factors contributing to healthy aging (Levine & Idler, 1981; Pratt, 1976).

Components of Healthy Aging

It is widely accepted that the foundations for healthy aging can be divided into four distinct components. In 1998, Dr. John Rowe and Dr. Robert Kahn proposed that the combination of the factors: avoiding disease and disease-related disability, maintaining high mental and physical function, and being actively engaged in life were integral to successful aging (Rowe & Kahn, 1998). The four components outlined in this section reflect a strategic shift towards prevention (Health Canada, 2002a; WHO, 2002). The components listed are also aligned to the Ministry of Health's goals and objectives.

(1) *Promoting health and preventing illness, disease and injury* — enabling people to increase control over and improve their health. Health promotion focuses on enhancing the capabilities and capacities of individuals, families and communities to make healthy choices and develop healthy and supportive environments.

(2) *Optimizing mental and physical function* — As people age, most people want to remain independent. To remain independent, people need to maintain physical and mental functions. Research shows that not only can functional loss in seniors be prevented, but that many functional losses can be regained (Rowe & Khan, 1998). Prevention strategies should focus on promoting lifestyle choices such as healthy eating, tobacco cessation, injury prevention, physical activity, and social and mental stimulation.

(3) *Managing chronic conditions* — Health promotion and disease prevention have substantial benefits for individuals and society as a whole. Specifically, they emphasize lifestyle changes such as physical activity, healthy eating, and tobacco cessation as essential in delaying or preventing many chronic diseases in later life. If chronic diseases such as cancer cannot be prevented, the second best way is to ensure that the disease is detected early. Objectives under this goal should focus on early disease detection strategies as well as prevention strategies.

(4) *Engaging with life* — To achieve healthy aging it is essential to have close relationships with others and to participate in regular activities that give meaning and excitement to life. For example, visiting friends, volunteering, maintaining some form of regular physical activity, and enjoying increased leisure time contributes to healthy aging and a better quality of life as people age (WHO, 2003).

Key Issues for Healthy Aging

In 2001, at a workshop sponsored by Health Canada on healthy aging (*Dare to Age Well*), four key issues were identified as those that had the greatest potential for changing or improving the current situation in the area of healthy aging. The issues were identified as healthy eating, injury prevention, physical activity, and tobacco cessation (Health Canada, 2002a). These four issues, in addition to social connectedness, are supported by the World Health Organization's "Active Ageing: A Policy Framework" (WHO, 2002). In May 2005, during the Eighth Meeting of the Federal/Provincial/Territorial Ministers Responsible for Seniors, Ministers adopted these issues as key issues that are crucial to healthy aging, where intervention could have a significant impact on health in later life. As well, Ministers recommended further work be undertaken to develop a profile of social isolation (its risk factors, characteristics, and consequences) and review selected programs and policies which negatively or positively impact social isolation.

Appendices A – E outline the importance of the key issues to B.C. seniors with a summary of the current status within B.C. and sample intervention strategies.

A cautious approach should be adopted when considering the five identified key issues. There are many other issues that health authorities and seniors themselves may identify as a priority for healthy aging. In recognition of this, health authorities will be encouraged to engage with their local communities and stakeholders to ensure their healthy aging priorities reflect local need and evidence. It is essential that the B.C. senior community be involved in the process of setting priorities, including establishing the criteria for selection. As part of this process, the following criteria, adapted from the World Health Organization approach to health promotion, may be useful. Using the best available data and evidence on the determinants of healthy aging and effectiveness of interventions, weigh each possible issue in terms of:

- The degree of impact on seniors' population health status (as measured by mortality, morbidity, quality of life);
- The availability and effectiveness of interventions to address the issue;
- The cost to the community of pertinent health and social conditions and their treatment and prevention; and

- The potential to reduce health inequities.

Much research is now available that identifies factors that facilitate or impede healthy aging, and many effective interventions to promote healthy aging are available. The challenge is to act on this evidence to ensure more rapid improvement in the health of B.C. seniors.

A fundamental element to the success of developing an effective blueprint to address healthy aging will be the planning tools for action. This will involve an interaction between the five key issues identified as crucial for healthy aging, the development strategies employed and the targeted spheres of influence.

Strategies for Healthy Aging

At the 2001 healthy aging workshop *Dare to Age Well*, Health Canada identified five key strategies for healthy aging (Health Canada, 2002a):

- Public Awareness and Education
- Public Policy and Legislation
- Community Action
- Professional Information and Education
- Knowledge Development

These strategies have a degree of overlap with the well-established health promotion strategies from the Ottawa Charter for Health Promotion (WHO, 1986). Therefore, for the purpose of this discussion paper the following strategies for healthy aging are proposed:

- Awareness and education (public and professional)
- Healthy public policy and legislation
- Strengthen community action
- Personal skills development
- Research, surveillance and evaluation
- Knowledge transfer
- Reorient health services/Building partnerships

Spheres of Influence

A co-ordinated, multisectoral approach to planning is of high importance to achieve effective healthy aging intervention. Such an approach involves as many sectors of society as possible and builds seniors' healthy aging capacity at the individual, family/friends, setting/communities, health sector/system and societal levels. These levels are referred to as spheres of influence.

Figure 3, illustrates a potential planning model for healthy aging in B.C. To operationalize the model, it is helpful to visualize it as consisting of many interior cubes each providing a potential blueprint for action. While the model may appear static, it becomes dynamic when used as a planning tool. Health authorities may use the model from different entry points. For example, one can begin with **Key Issues for Healthy Aging** that one intends to influence, the **Strategies for Healthy Aging** to be used, or the **Sphere of Influence** within which the action is to be taken.

A Population Health Approach

Like everyone else, seniors are subjected to economic, social and political pressures. From a health determinants perspective it is clear that chronological age alone is neither a reliable predictor nor indicator of a person's health, either now or in the future, and that there are a wide range of social, personal and psychological factors that are equally or more in influential in determining seniors' health status. It also demonstrates that one person's life experiences will not be the same as another's and neither will have a predictable effect on their health. Therefore, the health needs of one senior cannot be presumed to be the same as another. Any plan will need to take into account the health determinants that affect seniors.

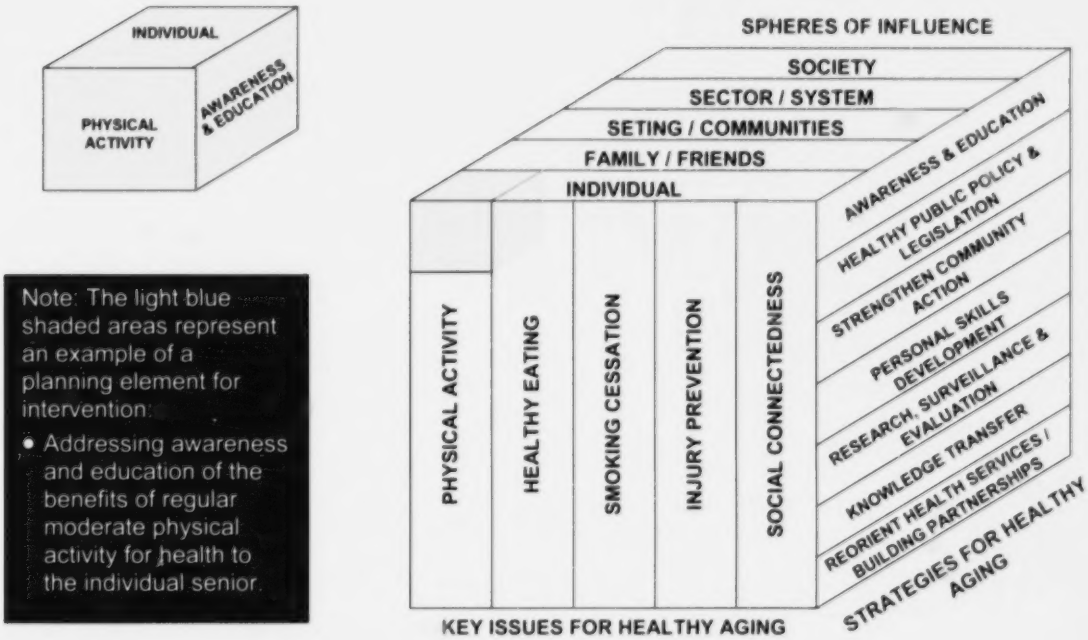

INDIVIDUAL
PHYSICAL ACTIVITY
AWARENESS & EDUCATION
Note: The light blue shaded areas represent an example of a planning element for intervention:
• Addressing awareness and education of the benefits of regular moderate physical activity for health to the individual senior.
SPHERES OF INFLUENCE
SOCIETY
SECTOR / SYSTEM
SETING / COMMUNITIES
FAMILY / FRIENDS
INDIVIDUAL
PHYSICAL ACTIVITY
HEALTHY EATING
SMOKING CESSATION
INJURY PREVENTION
SOCIAL CONNECTEDNESS
KEY ISSUES FOR HEALTHY AGING
AWARENESS & EDUCATION
HEALTHY PUBLIC POLICY & LEGISLATION
STRENGTHEN COMMUNITY ACTION
PERSONAL SKILLS DEVELOPMENT
RESEARCH, SURVEILLANCE & EVALUATION
KNOWLEDGE TRANSFER
REORIENT HEALTH SERVICES / BUILDING PARTNERSHIPS
STRATEGIES FOR HEALTHY AGING

Figure 3. Potential healthy aging planning model (adapted from Hamilton & Bhatti, 1996).

Healthy aging is linked to a combination of interrelated factors of twelve health determinants. Identified determinants of healthy aging are health and social services, income and social status, social support networks, education, employment and working conditions, social environment, physical environment, biology and genetic endowment, personal health practices and coping skills, healthy development, and two cross-cutting determinants of gender and culture.

Health authorities and other stakeholders will be encouraged to develop healthy aging strategies and interventions that take full account of the determinants of health lens. This will ensure that underlying factors for lifestyle behaviours can be defined and addressed.

A Population Health Approach

Like everyone else, seniors are subjected to economic, social and political pressures. From a health determinants perspective it is clear that chronological age alone is neither a reliable predictor nor indicator of a person's health, either now or in the future, and that there are a wide range of social, personal and psychological factors that are equally or more in influential in determining seniors' health status. It also demonstrates that one person's life experiences will not be the same as another's and neither will have a predictable effect on their health. Therefore, the health needs of one senior cannot be presumed to be the same as another. Any plan will need to take into account the health determinants that affect seniors.

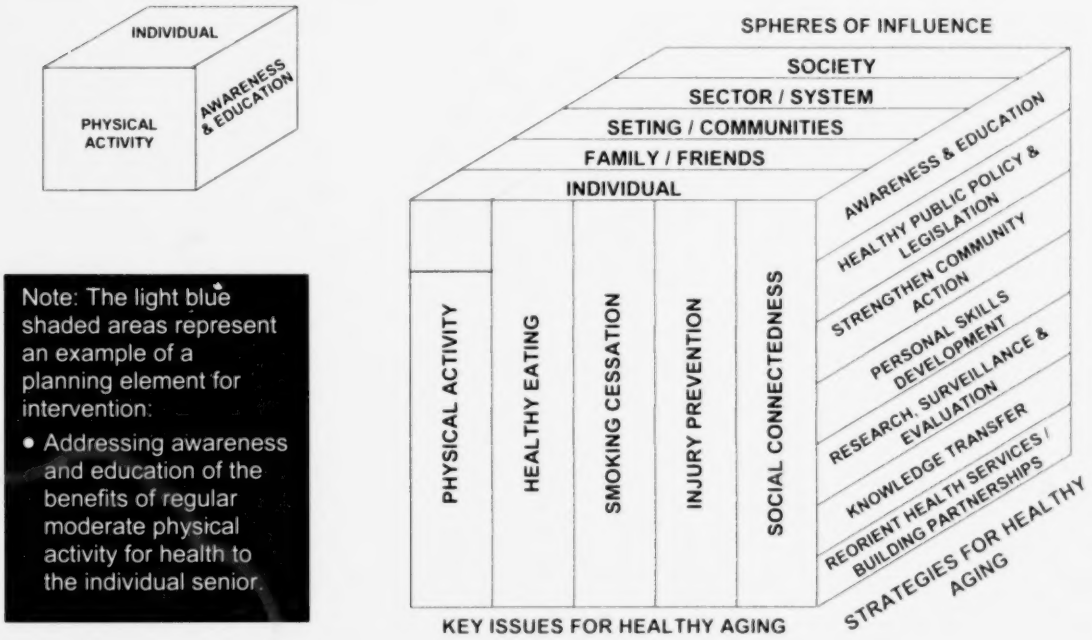

INDIVIDUAL
PHYSICAL ACTIVITY
AWARENESS & EDUCATION
Note: The light blue shaded areas represent an example of a planning element for intervention:
• Addressing awareness and education of the benefits of regular moderate physical activity for health to the individual senior.
SPHERES OF INFLUENCE
SOCIETY
SECTOR / SYSTEM
SETING / COMMUNITIES
FAMILY / FRIENDS
INDIVIDUAL
PHYSICAL ACTIVITY
HEALTHY EATING
SMOKING CESSATION
INJURY PREVENTION
SOCIAL CONNECTEDNESS
KEY ISSUES FOR HEALTHY AGING
AWARENESS & EDUCATION
HEALTHY PUBLIC POLICY & LEGISLATION
STRENGTHEN COMMUNITY ACTION
PERSONAL SKILLS DEVELOPMENT
RESEARCH, SURVEILLANCE & EVALUATION
KNOWLEDGE TRANSFER
REORIENT HEALTH SERVICES / BUILDING PARTNERSHIPS
STRATEGIES FOR HEALTHY AGING

Figure 3. Potential healthy aging planning model (adapted from Hamilton & Bhatti, 1996).

Healthy aging is linked to a combination of interrelated factors of twelve health determinants. Identified determinants of healthy aging are health and social services, income and social status, social support networks, education, employment and working conditions, social environment, physical environment, biology and genetic endowment, personal health practices and coping skills, healthy development, and two cross-cutting determinants of gender and culture.

Health authorities and other stakeholders will be encouraged to develop healthy aging strategies and interventions that take full account of the determinants of health lens. This will ensure that underlying factors for lifestyle behaviours can be defined and addressed.

Principles

Five principles identified by the National Framework on Aging (NFA) (Health Canada, 1998) will underpin future healthy aging interventions and policies. The NFA principles on aging provide a common national framework for jurisdictions to address healthy aging. They are:

Dignity	Being treated with respect, regardless of situation, and having a sense of self-esteem.
Independence	Being in control of one's life, being able to do as much for oneself as possible and making one's own choices.
Participation	Getting involved, staying active and taking part in the community, being consulted and having one's views considered by government.
Fairness	Having seniors' real needs, in all their diversity, considered equally to those of other Canadians.
Security	Having adequate income as one ages and having access to a safe and supportive living environment.

The above stated principles are also consistent with the United Nations principles for older persons, namely, self-fulfillment, care, participation, dignity and independence (United Nations General Assembly, 1991).

Integration within Strategic Developments

There are a number of key strategic developments that will provide a platform for the development of *Healthy Aging through Healthy Living*. Figure 4 shows a graphical representation of the interaction between current Ministry of Health strategic developments.

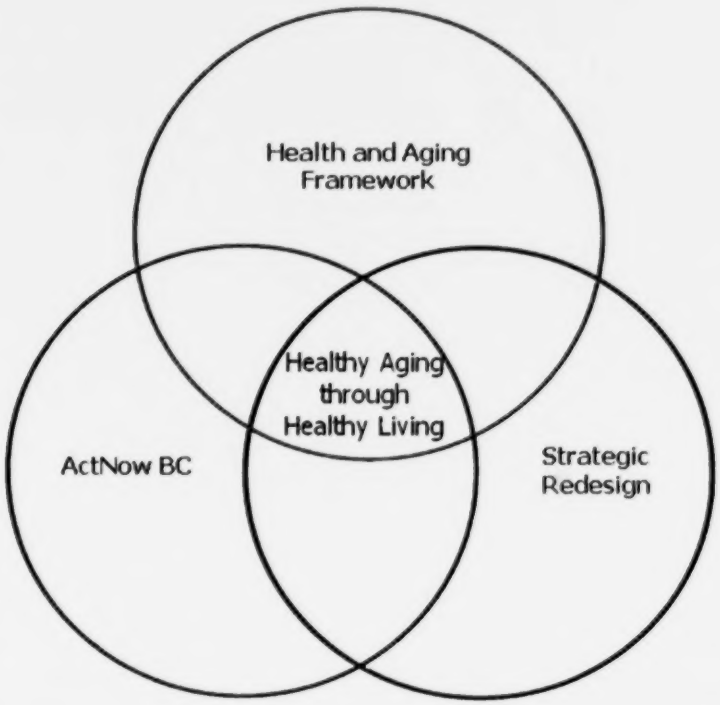


Figure 4. Represents the positioning of Healthy Aging through Healthy Living within current Ministry of Health's strategic developments.

Strategic Redesign

The Ministry of Health has a vision of a modern health system that supports British Columbians across their life span, whether they need support to stay healthy, get better from an illness or injury, live with and manage a chronic disease or disability, or cope with the end of life (B.C. Ministry of Health, 2005b). The Ministry of Health envisions the health system providing a continuum of supports across four domains, reflecting individual and community health needs. Over an individuals life cycle they may require support to:

- Stay Healthy - health promotion and disease prevention.
- Get Better - intermittent use of primary, community and hospital care.
- Manage Disease - chronic care.
- Cope with End-of-Life - hospice/palliative care

Strategic investments within and across these four domains will result in a health system that is better able to respond to the population's health needs in an efficient and effective manner, regardless of changes in demographics and service options. Together, this planning model, comprised of domains, dimensions, system shifts and strategic investments, establishes a framework by which the province will advance to the next phase of redesign.

The development of a healthy aging framework will be harmonious with these redesign plans. The framework will be primarily positioned within the domain of 'Stay Healthy', however it can be integrated throughout the continuum of care.

ActNow BC

On March 19, 2005, the Government of British Columbia officially launched ActNow BC, a cross-ministry, partnership-based, community-focused healthy promotion platform that will help all British Columbians make healthier lifestyle choices.

ActNow BC includes programs and services to help British Columbians quit smoking, become more physically active, eat healthier and increase the understanding of the risks associated with alcohol consumption during pregnancy. ActNow BC partners include 2010 Legacies Now and the BC Healthy Living Alliance, which promote physical activity, healthy eating and living smoke free.

Healthy Aging through Healthy Living will be linked to ActNow BC particularly through physical activity, healthy eating and tobacco cessation. For seniors, good nutrition and physical activity is essential for health, independence and length and quality of life and reduce health problems associated with cancer, osteoporosis, cardiovascular disease, obesity and has substantial physical and psychological benefits.

While most seniors in B.C. rate their health as either excellent or very good (B.C. Ministry of Health Services, 2004), a significant proportion of the senior population is not physically active, presenting a potential health issue. Younger age groups are more likely to be physically active than seniors age 65 and older, and younger seniors are more likely to be physically active than older seniors (BC Stats, 2005).

Falls are a particular health issue for the entire population but present special consideration for seniors. Behavioral factors such as use of medication, inadequate diet and physical activity and alcohol abuse are some of risks associated with falls. The prevention of falls includes exercise programs and education, among others (Scott, Peck & Kendall, 2004).

Lower calorie requirements, yet higher nutrient requirements, the loss of lean body mass and less physical activity associated with aging contribute to an increased risk of malnutrition and nutrient intake deficiencies that may affect the functioning and quality of life of seniors. However, 63 percent of B.C. seniors are overweight or obese. Too many high calorie, low nutrient foods contributed to this finding (B.C. Ministry of Health, 2005d).

Tobacco use is the number one preventable cause of death and disease in Canada, and it is implicated in eight of the top 14 causes of death for adults 65 years of age or older (Chappell, et al., 2003). Smoking causes disabling and fatal diseases, including lung and other cancers, heart and circulatory diseases, and respiratory diseases such as emphysema. Smoking also accelerates the rate of decline in bone density, contributing to osteoporosis during aging (Chappell, et al., 2003). The good news is only a small percentage of seniors in B.C. smoke daily and they are less likely to smoke daily than younger age groups (BC Stats, 2005).

ActNow BC currently supports several nutrition, tobacco cessation and physical activity programs and services such as Dial-A-Dietitian, quitnow.ca (by phone or on-line), Community Food Action Initiative and Active Communities that are available to all British Columbians, regardless of age.

As well, the Health and Seniors Information Line (Info Line)[1] has been expanded and enhanced to include comprehensive information to seniors. It provides one-stop, toll free telephone access to information about federal, provincial, and health programs and services for seniors. Info Line staff help seniors navigate and access the array of public programs and benefits to which seniors are entitled including information about eligibility for programs, how to access them, and help in filling out application forms. As well, BC HealthGuide handbook has been revised to include new information specific to the health needs of older adults age 50+.

The British Columbia Nutrition Survey: Report on Seniors' Nutritional Health was released in the fall of 2005 and provides valuable baseline information on the nutritional health of B.C.'s free-living senior population aged 65 to 84 years (B.C. Ministry of Health, 2005d). Comparable data for 2004 is being gathered and will be released in 2006 and will allow for the development of trend-based information and analyses of nutrition and B.C. seniors.

Common objectives linking new and existing initiatives will need to be developed to accomplish a healthy aging vision, as well as identifying emerging gaps (such as strategies to increase physical activity in seniors) where action needs to be taken. It will be essential for the Ministry of Health to work in close partnership with other ministries, health authorities, seniors groups, and other non-government organizations to achieve these goals.

Health and Aging Framework

In October 2004, the Ministry of Health Services facilitated a 2-day *Dialogue on Health and Aging in British Columbia*. The subsequent report "From Dialogue to Action" (Ministry of Health, 2005a) identified the need to ensure seniors remain well throughout their lives by improving prevention and health promotion efforts and encouraging healthy lifestyles. Understanding the links between the health and determinants of health, such as income, gender, housing and personal health practices, was seen to be crucial in planning for an aging population.

---

[1] Health and Seniors Information Line: 1-800-465-4911

The international experts at the symposium concluded that there was the need to develop more informed and activated communities that would support the province's Health and Aging Framework. This calls for a change in care giving approaches and for educating all British Columbians about the process of aging and the needs and capacities of seniors. Such an approach would expand the range of perspectives brought to bear on dialogues about healthy aging.

A provincial Health and Aging Framework would be congruent with the four domains of the health system redesign. *Healthy Aging through Healthy Living* would be the front-end (Staying Healthy) component of the overall Health and Aging Framework. This would also facilitate the integration of healthy aging principles throughout the continuum of care.

Moving Forward: A Partnership Approach

Ministry of Health Stewardship Role

As stewards of the system, the Ministry of Health provides leadership and support to our health system partners, including health authorities, physicians and other care providers. The Ministry of Health sets the overall strategic direction for the health system, provides the appropriate legislative and regulatory frameworks to allow it to function smoothly. The Ministry of Health also monitors the health of the population and evaluates health system performance, and takes corrective action where necessary to ensure the population's health needs are being met (B.C. Ministry of Health, 2005b).

The lead Division within the Ministry of Health for the development of a healthy aging framework is Population Health and Wellness (PHW). PHW exercises stewardship for public health services by providing effective direction, meaningful support, targeted monitoring, rigorous evaluation, and strategic intervention where appropriate. It invests strategically, based on the best available research data and evidence of best outcomes. It facilitates best practice development and evaluation of legislation, policies, strategies, best practices, and performance expectations (B.C. Ministry of Health Services, 2005).

Partnership Approach

It is important to recognize the role of partners in addressing healthy aging of B.C.'s population. To initiate effective strategies will require collaborative partnerships and the collective action of government ministries at all levels as well as partnerships with health authorities, with non-profit, private and voluntary sectors, and with seniors themselves. The process for identifying strategic priorities for B.C. will be developed collaboratively. The Ministry of Health will consult with a broad range of individuals, health authorities and other key stakeholders, and community partners.

Public consultation will identify priority areas for action, leading to the development of a government action plan for healthy aging in B.C.

Healthy Aging through Healthy Living will serve as a guide for the development of region-specific healthy aging plans for the five regional health authorities and the Provincial Health Services Authority. Each regional health authority will be responsible for identifying regional healthy aging needs in their community and developing a plan including appropriate health promotion, disease prevention to address the strategic priorities identified in *Healthy Aging through Healthy Living*.

Consequently, new strategic priorities may arise, which will allow for targeted healthy aging interventions and services for each region. The Ministry of Health will ensure that healthy aging priorities are being addressed in each region by monitoring success through a performance measurement system.

Ownership, Measures and Targets

Ownership, measures and targets will be carefully allocated to each intervention of the healthy aging strategy. The ownership for each initiative will be delegated to a body of people such as health authorities, governmental ministries, or seniors' organizations. Allocating ownership to initiatives brings a sense of responsibility and accountability to the owner of each initiative.

Measures and targets will allow the Ministry of Health to report on the short and long-term accomplishments. In addition to helping achieve desired behaviours and results, targets and measures will provide B.C. with direction to focus its efforts on what needs to be accomplished to achieve healthy aging.

Healthy Aging through Healthy Living will involve a healthy aging vision, a number of guiding principles, and broad overall goals to address strategic priorities associated with healthy aging. Regional objectives and interventions should be identified by health authorities and incorporated within overarching goals and objectives of *Healthy Aging through Healthy Living.*

Conclusion

The development of *Healthy Aging through Healthy Living* is an important component to fulfill the Ministry of Health's goal *to improved health and wellness for British Columbians*. Also, to prevent overcrowded hospitals and longer waiting lists for services, it is crucial for government to change its focus from an acute care model to a "health care" model with an increased emphasis on prevention (The Legislative Assembly of British Columbia, 2004). In addition to helping sustain the health care system, implementing a healthy aging strategy will result in healthier, more active and productive seniors. To achieve these results, the B.C. Government will need the sustained efforts and cooperation of multiple stakeholders, including the health authorities and seniors' organizations. Finally, achieving healthy aging through lifestyle changes will come from a complex, long term and meaningful process that will empower seniors to make healthy choices to improve their health in safe environments where the design and social aspects encourage participation.

Appendix A: Healthy Eating Evidence

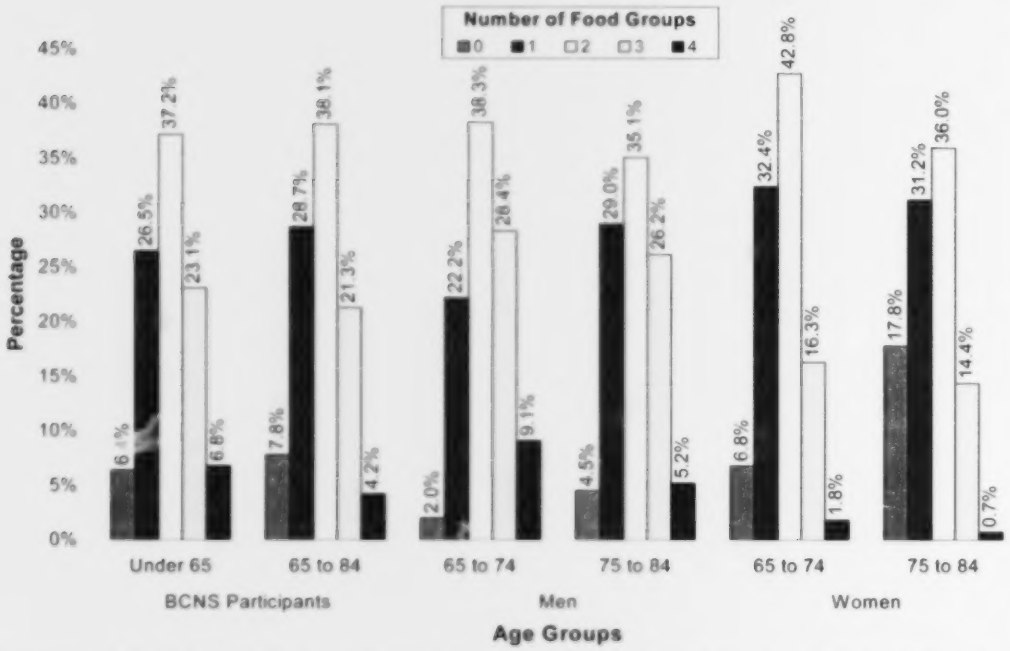
Importance of the Issue

Nutrition is a key factor in health throughout the life span, and a vital contributor to the overall health of seniors. When compared to younger age groups, seniors have higher needs for protein, vitamins and minerals; however, they also usually need fewer calories than younger adults (National Advisory Council on Aging, 2004b). Choosing food that meets dietary needs is increasingly important as people age. For seniors, healthy eating plays an important role in preventing chronic diseases and maintaining good health and functional autonomy. Paired with physical activity, healthy dietary practices are critical for seniors to remain independent, maintain their quality of life and reduce risk of developing chronic conditions. When looking at healthy eating for seniors, it is important to recognize that they are a unique group with respect to attitudes and eating habits, determinants of nutritional status, vulnerability to energy and nutritional deficiencies, and prevalence of nutritional problems.

Magnitude of the Problem in B.C.

Although almost half of Canadian adults age 55 years or older rate their eating habits as "very good" or "excellent", the B.C. Nutrition Survey found that most adults, including seniors, did not eat enough from each food group of the Canada's Food Guide to Healthy Eating (see Figure 5) (B.C. Ministry of Health, 2005d).

Figure 5: Percentage of Population who met Canada's Food Guide to Healthy Eating Guidelines for either 0, 1, 2, 3, or 4 food groups according to the B.C. Nutrition Survey participants' one-day dietary recalls, by age and Gender, B.C. 1999.



Source: (B.C. Nutrition Survey: Report on Seniors' Nutritional Health, B.C. Ministry of Health, 2005d).

Failing to eat the recommended five servings of vegetables and fruits per day leads to inadequate intake of important vitamins and minerals, such as folate needed for healthy blood and bones. Low dietary fibre intake is also an important concern for B.C.'s seniors since the same survey revealed that over 80 percent of seniors were not getting the amounts recommended for a healthy digestive system and to reduce the risk of chronic diseases. Similarly, more than 80 percent of seniors were considered having a low daily intake of dietary calcium, which may lead to osteoporosis. In addition, about 70 percent of women aged 75 to 84 were considered at risk for inadequate intakes of key minerals and vitamin B12 needed for normal blood and nerve function (B.C. Ministry of Health, 2005d).

Consequences of Malnutrition

Older age groups are at higher risk for malnutrition since they require lower calorie intake, yet higher nutrient intake, while their body mass and activity levels are usually decreasing. Frail seniors are more at risk for malnutrition as it is increasingly difficult for them to do their own shopping and cook their own meals. In addition, loss of appetite in seniors may be a symptom of depression, isolation, or other psychological distress.

A substantial body of evidence shows that low intake of fruits and vegetables is associated with increased risks of a variety of cancers (Diet and Cancer, 1993). Inadequate intake of vitamin D, B12 and folate has also been shown to be associated with osteoarthritis, and inadequate intake of Omega-3 fatty acids has been linked to higher risks for rheumatoid arthritis through the effect on immune response (Flynn, et al. 1994; Shapiro, et al., 1996). Inadequate intake of energy and nutrients, and malnutrition in seniors result in decreased body strength, reduced immunity, lower resistance to infection, increased pressure sores, higher surgical mortality rates, increased caregiver burden, increased acute and long term care admissions and lower quality of life (Dietitians of Canada, 1998). Moreover, weight loss and low body weight in seniors are associated with hip fractures, decreased independence, and increased mortality rates (Health Canada, 2002b). Early intervention is critical to avoid the downward spiral associated with malnutrition that often occurs without immediate explanation and involves a gradual decline in cognitive and physical functions, weight loss, reduced appetite, and social withdrawal (McCormack, 1997).

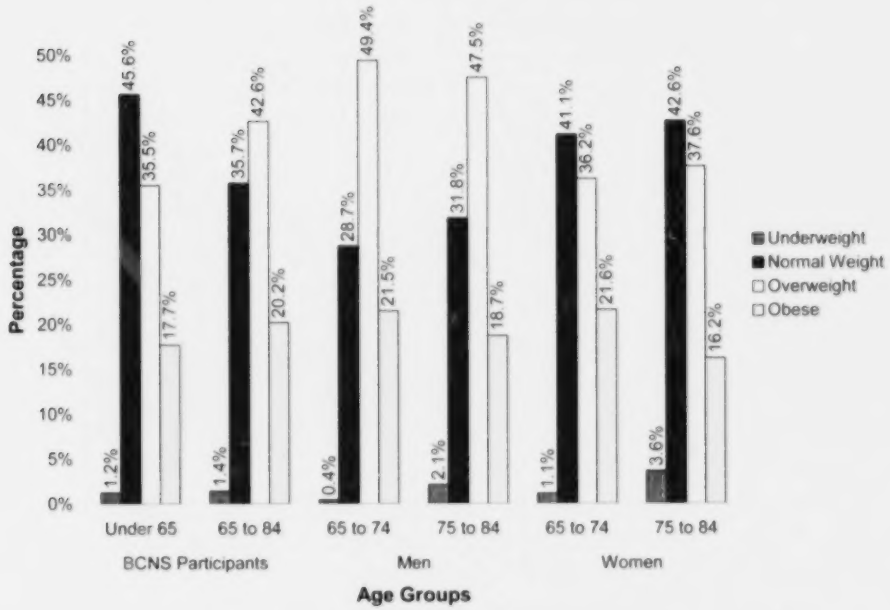
Overweight and Obesity in Later Life

Figure 6 shows the Body Mass Index (BMI) categories as measured as part of the B.C. Nutrition Survey (1999 data). 63 percent of the B.C. seniors' population was classified as overweight or obese, compared to 53 percent of the adult population less than 65 years of age. Among seniors, more men than women are overweight, indicating an apparent gender difference (B.C. Ministry of Health, 2005d).

Figure 7 shows the most recent data on obesity in B.C. with almost 69 percent of 65 to 74 years seniors being either overweight or obese (2004 data). This trend seems to suggest that the proportion of seniors who are overweight and obese is on the increase.

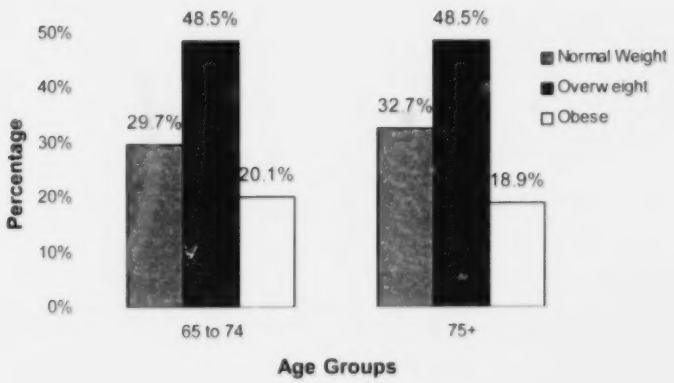
Obesity will become an increasing issue associated with healthy aging since the baby boomers tend to be heavier than previous generations, and that they are likely to become even heavier as they retire. Obesity is usually associated with a bad diet and sedentary lifestyles. Obesity is a common chronic condition in seniors that is associated with type II diabetes, heart disease, stroke, hypertension, gallbladder disease, sleep apnea, and osteoarthritis (National Task Force on the Prevention and Treatment of Obesity, 2000).

Figure 6. Percent Distribution of Body Mass Index (BMI) by Age and Gender for the Seniors' Population, B.C. 1999.



Source: (B.C. Nutrition Survey: Report on Seniors' Nutritional Health, B.C. Ministry of Health, 2005d).

Figure 7. Percent Distribution of Body Mass Index (BMI) by Age for B.C. Seniors' Population, B.C. 2004.



Source: (Statistics Canada, Canadian Community Health Survey, Cycle 2.2, Nutrition, 2004)

Benefits of Healthy Eating

A healthy diet includes a variety of food high in fibre, as well as food low in fat, salt, and cholesterol (Lemme, 1999). At least five portions of fruit and vegetables should be part of our daily diet (Dietitians of Canada, 1998). A diet including a high intake of fruits and vegetables has been associated with protective benefits against visual loss, cataracts, respiratory diseases, and some cancers (Khaw, 1997). Also, a diet lower in fat has been shown to reduce risks of death and disabilities from heart disease (Yen, 1998). Folic acid appears to play a role in preventing heart disease; and seniors are encouraged to eat more grains, fruits and vegetables to meet their folate needs (Dietitians of Canada, 1998).

A diet including potassium and low sodium consumption has been linked to a reduced risk of high blood pressure (National Advisory Council on Aging, 2004b). Indeed some interventions may have even more impact in older people than younger people. For example, reducing sodium in the diet reduces blood pressure more in older than younger people (Khaw, 1997).

As people grow older, it is essential to maintain sufficient protein intake as well as abundant intakes of vitamin E, D, B-12, folate, and calcium (Lemme, 1999). Again, seniors are at higher risk for inadequate intake of vitamin D due to age related decline in the efficiency of vitamin D synthesis, inadequate dietary intake, low exposure to sunlight, and regular use of sunscreen (Dietitians of Canada, 1998). Adequate calcium intake helps to maintain bone mass as well as preventing bone loss associated with aging (Leslie & St. Pierre, 1999).

Intervention Strategies

Health Canada found that nutrition education interventions specifically targeted to seniors are scarce. Health Canada suggests that future nutrition intervention strategies target populations at risk for malnutrition and include current knowledge of energy and nutrient needs in older age, as well as food choices, attitude and consumption practices of seniors. Particularly, two types of intervention were recommended: (1) prevent malnutrition through promotion of optimal nutrition or screening in populations at risk to prevent or delay decline in muscle mass and strength; and (2) target undernourished seniors and seek to increase muscle mass through nutrition supplementation, along with a progressive increase in physical activity (Health Canada, 2002b).

With the increase of obesity within the B.C. population, interventions will need to be developed that are tailored specifically towards the needs of seniors.

Appendix B: Injury Prevention Evidence

Importance of the Issue

Among B.C. seniors, unintentional injuries are a major public health problem, which involves expensive costs to the health care system as well as serious consequences to the seniors themselves. For example, many injuries result in long-term disability, serious decline in function, chronic pain, institutionalization, and in some instances death. For Canadian seniors, falls are responsible for about 84 percent of injury-related hospital admissions and 40 percent of admissions in nursing homes (Health Canada, 2002c). The annual direct and indirect health care costs associated with fall related injuries for Canadians aged 65 and older are estimated at $2.8 billion (Health Canada, 2002c).

Other common causes of injuries seniors experience are motor vehicle crashes, poisoning, drowning, suffocation, and fires. Unintentional injuries associated with falls or other causes are usually predictable and preventable. In particular, by identifying the risk factors associated with unintentional injuries and implementing preventive intervention strategies, it is possible to eliminate or minimize their impact.

Magnitude of the Problem in B.C.

In 2004, the Office of the Provincial Health Officer in B.C. published a report on the prevention of falls and injuries among the elderly (Scott, Peck & Kendall, 2004). The report provides a comprehensive overview of the impact and seriousness of this issue in B.C. Particularly, research shows that one in three persons over the age of 65 is likely to fall at least once each year. When translating this statistic to B.C. numbers, it is estimated that 147,000 British Columbians over the age of 65 are likely to fall in the year 2004. This is worrisome when one considers that almost half of those who fall experience a minor injury and between 5 to 25 percent suffer from a more serious injury, such as a fracture or a sprain. Moreover, epidemiological research in B.C. showed that, in 2001, 10,000 seniors were hospitalized as a result of falls, while another 771 died. When looking at the past decade, the data also shows that the absolute number of seniors admitted to hospital due to fall-related injuries has increased from 9,181 in 1992/93 to 10,242 in 2000/01. Interestingly, most of the increase in fall-related hospitalization in the past decade was accounted by people aged 85 and over, and this number is likely to continue increasing considering B.C.'s projected aging population distribution (Scott, Peck & Kendall, 2004).

When compared to other age groups, falls in seniors are more likely to result in serious fractures and longer periods of recovery, which lead to longer use of health care resources. In particular, the average length of hospital stay was more than twice as long for falls when compared to all other causes of hospitalization for people over the age of 65. One of B.C.'s current priorities is to provide timely access to quality care and reduce wait times for individuals in need. The fact that, for seniors, the average length of hospital stay due to falls is more than twice as long than all other causes of hospitalization provides a good basis for developing preventive intervention for falls (Scott, Peck & Kendall, 2004).

Health Care Savings Associated with Fall Prevention

Important costs are associated with falls each year in B.C. For example, falls accounted for 85 percent of all unintentional injuries in B.C. seniors, and in 1998 cost the province $180 million in direct health care expenses. Using the current hospitalization rates for falls among seniors, it was predicted that if B.C. could reduce falls by 20 percent in that age group, this would lead to 1,400 fewer hospital stays, and 350 fewer disabled seniors. Furthermore, the associated decrease in health care costs could result in a total saving of $25 million a year (Scott, Peck & Kendall, 2004).

Studies have shown that 90 percent of all hip fractures in seniors are caused by falls. Treatments associated with hip fractures represent substantial health care costs. Specifically, it is estimated that a single hip fracture adds $24,400 to $28,000 in direct costs to the health care system (Scott, Peck & Kendall, 2004).

Risk Factors For Falls

Four factors that contribute to the risk of falling among a population of seniors are: (1) biological, (2) behavioural, (3) environment and (4) social and economic factors (Scott, 2000). Table 2 further describes each risk factor. Understanding how these risk factors interact as well as where the falls take place will help develop effective preventive interventions to reduce the rate and impact of falls among B.C.'s seniors.

Table 2: Direct and Indirect Risk Factors for Falls and Fall-related Injuries Among Seniors.

Biological	Behavioural	Environmental	Social / Economic
• Advanced age • Female gender • Chronic and acute illness • Physical disability • Muscle weakness • Osteoporosis • Stiffness • Poor vision, mobility, balance, or coordination • Cognitive impairments	• Attempting to do activities or chores beyond one's physical ability (e.g. pruning trees or clearing snow) • Use of medication (e.g. tranquilizers) • Alcohol abuse • Wearing inappropriate footwear • Inadequate diet • Inadequate physical activity	• Home hazards (e.g. loose carpets, poorly lit stairs, cluttered floors, slippery showers) • Community hazards (e.g. pavement cracks, tree roots, slippery footing, obstacle in walk way) • Institutional hazards (e.g. poorly designed or maintained buildings, slippery floors, poor lighting, and lack of handrails)	• Inadequate income • Low education • Inadequate housing • Lack of social network

Source: (Rubenstein, L., Stevens, J. & Scott, V., *unpublished.* Preventing Falls Among Older Adults, Chapter in U.S. Center for Disease Control Handbook on Injury and Violence Prevention Interventions).

Intervention Strategies

Studies have shown that many risk factors for falls and fall-related injury can be modified with preventive intervention strategies (Health Canada, 2002c). The strongest evidence based interventions are (Scott, Peck & Kendall, 2004):

- Clinical assessments to identify and then reduce the risk of falls by using targeted multi-factorial interventions, including education, exercise, environmental modification, medication modification, or hip protectors.
- Exercise programs to improve balance and strengths.
- Environmental modification

In sum, the evidence emphasizes that the use of multidisciplinary teams and multi-factorial strategies to be the most effective approach to prevent falls amongst seniors.

The Provincial Health Officer's report outlined 31 recommendations for action across a wide variety of disciplines and sectors. More recently a Provincial Falls Prevention Coalition has been established to coordinate falls prevention efforts across B.C.

Appendix C: Physical Activity Evidence

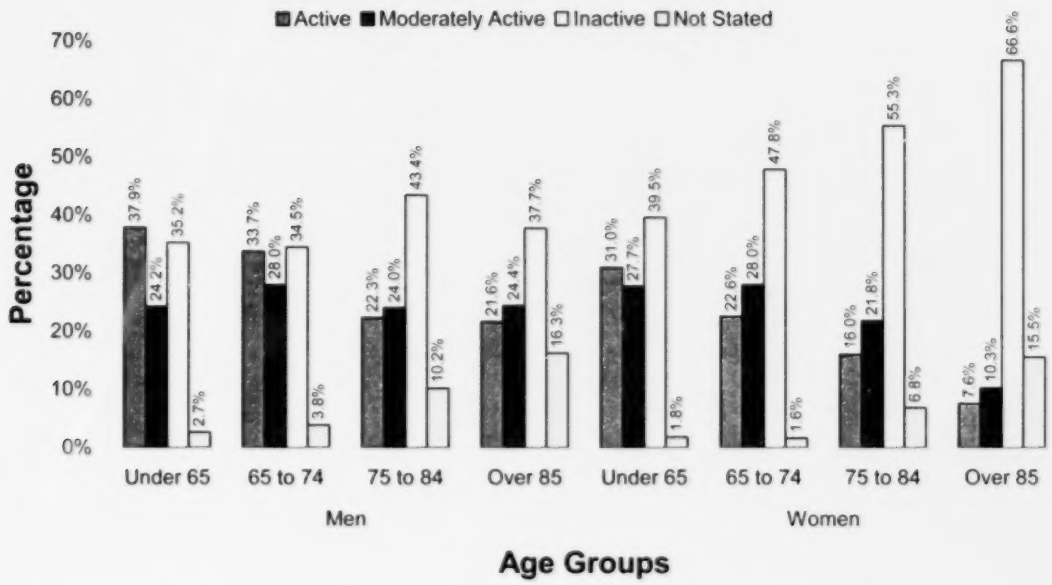
Importance of the Issue

It is now well established in the literature that regular physical activity brings significant health benefits to people of all ages. On the other end, inactivity is associated with decrease in bone strength, muscle strength, and heart and lung fitness and flexibility. Moreover, living a sedentary lifestyle contributes to the development of most chronic and debilitating diseases associated with aging. Research shows that regular physical activity is the most significant route to better health, enhanced quality of life and maintaining independence.

Magnitude of the Problem in B.C.

When compared with younger age groups, seniors are more likely not to engage in sufficient levels of physical activities to gain health benefits. Figure 8 depicts the levels of physical activities of B.C.'s seniors by gender and age group. In B.C., seniors represent the most inactive segment of population, with women being even less active than men, and older seniors less active than younger seniors. Furthermore, the percentage of seniors who engage in daily physical activities tends to decrease with age, especially for women (see Figure 9). The fact that a significant proportion of seniors live a sedentary lifestyle make this segment of the population at high risk for poor health, with older seniors and women at even higher risk. These are important figures to consider with the rapidly aging population due to the generation of baby boomers getting older.

Figure 8. Physical Activity Level of Seniors by Gender and Age, B.C. 2003.



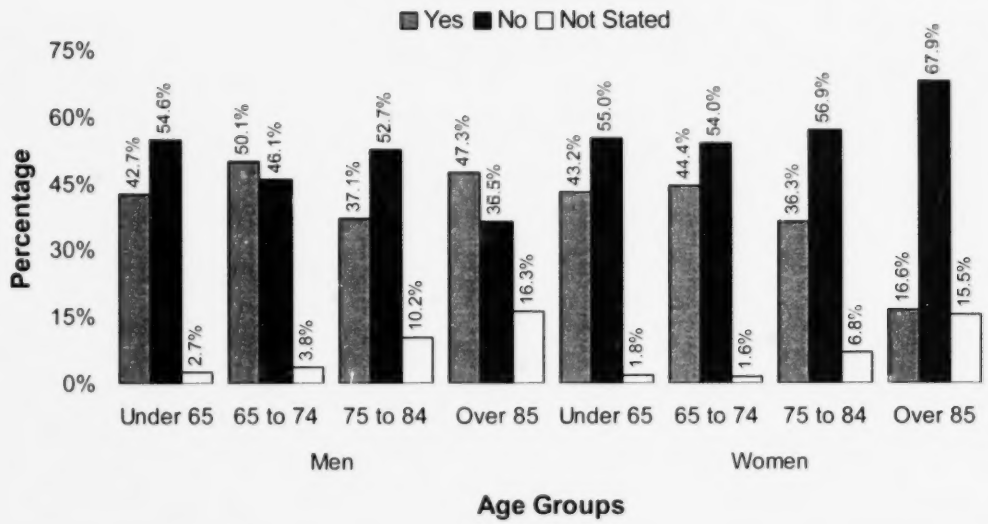
Source: (Statistics Canada, Canadian Community Health Survey, Cycle 2.1, 2003).

Benefits of Physical Activity

Physical activity greatly contributes to health by producing numerous physical and psychological benefits at any age (Lemme, 1999). A large body of evidence shows that physical activity provides numerous health related benefits, maintain functional ability, enhance psychological health, and prevent and manage chronic diseases and health problems, including:

- Arthritis
- Heart attack and stroke
- Cardiovascular diseases
- Type 2 adult-onset diabetes
- Mild to moderate depression
- Anxiety
- Stress related conditions
- High blood pressure
- Osteoporosis
- Breast and colon cancer
- Obesity
- Back pain
- Prevention of Falls

Figure 9. Percentage of Seniors, by Age and Gender, Participating in Daily Physical Activity, B.C. 2003.



Source: (Statistics Canada, Canadian Community Health Survey, Cycle 2.1, 2003).

Physical activity is important for seniors because it helps them maintain muscle strength, coordination, joint function and flexibility. Regular physical activity also contributes to functional and cognitive capacity, and—by facilitating daily life activities—contributes to increased autonomy and well-being. Also, physical activity plays a critical role for healthy aging as it acts as a core element to other positive health-promoting behaviours. For example, the lowest use of tobacco products is found among the most active

population. Finally, increased levels of physical activity can also contribute to the prevention of injuries.

Most importantly, regardless of past activities or sedentary habits, it is never too late to start exercising to improve health and to feel the psychological and physical benefits associated with an active life-style.

Cost of Inactivity in Later Life

While being physically active brings multiple benefits and significantly contributes to healthy aging, inactivity has a high cost. In particular, inactivity is associated with premature death, chronic diseases, illness and disability, as well as reduced quality of life and independence. In addition to the high health costs associated with inactivity, numerous societal consequences also arise, including reduced volunteering, increased caregiver burden, decreased independence and capacity for self-care, reduced labour force participation, and increased retirement by older workers.

Health Care Savings Associated with Physical Activity

In Canada, a 16 percent increase in the number physically active Canadians from 1981 to 1995 translated in a cost saving of $700 million for ischemic heart disease over that period, and $190 million for ischemic heart disease in 1995 alone (Canadian Fitness and Lifestyle Research Institute, 1998). A study commissioned from the Conference Board of Canada by the Canadian Fitness and Lifestyle Research Institute estimates that a 1 percent decrease in the number of inactive Canadians may reduce health care cost for ischemic heart disease by $10,233,000 annually. Savings for type II diabetes and colon cancer have been estimated at $877,000 and $407,000 respectively (Canadian Fitness and Lifestyle Research Institute, 1998). Although these statistics are for the Canadian population, it is reasonable to infer that important health care savings would also be an outcome associated with increased physical activity in the B.C. population.

Intervention Strategies

Evidence shows that the most effective physical activity interventions include a wide range of approaches including education and awareness raising, community based programs and home-based interventions. The World Health Organization (WHO) suggests that it is more cost effective to target intervention strategies to sedentary individuals instead of persuading moderately active people to become more active. WHO also proposes that intervention strategies focus on access, and partnership with community, institutional settings, and health professionals (WHO, 2002).

It is important to note that to be beneficial in the long run, physical activity must be maintained throughout life. Specifically, adults who are physically active in mid-life and discontinue exercising in later life have no long-term benefits, whereas adults who start exercising in later life and maintain their exercising routine will benefit from substantial health gains. Therefore, strategies for the promotion of physical activity require a long-term commitment and sustainable actions throughout life (Health Canada, 2002d).

Appendix D: Tobacco Cessation Evidence

Importance of the Issue

Tobacco use is the number one preventable cause of death and disease in Canada (Health Canada, 2002e). In addition, tobacco use is associated with eight of the top fourteen causes of death in adults over 65 years of age (Chappell, 1999). Smoking causes numerous disabling and fatal diseases such as lung and other cancers, heart and circulatory diseases, and respiratory diseases. Smoking has also been associated with accelerated decline of bone density in older age (Chappell, 1999). For example, evidence shows that at age 70, smokers have a lower bone density and a higher risk for fracture than non-smokers. Furthermore, women who smoke are at higher risk for post-menopausal osteoporosis (Health Canada, 2002e).

Research shows that tobacco use is associated with decreased physical functioning as people age. It is also shown that half of long-term smokers die from tobacco-related illnesses. Specifically, half of these die in middle age, while the other half suffers from various chronic conditions related to smoking and die in later age. However, tobacco cessation strategies are extremely hopeful when considering that many negative health effects associated with smoking can be reversed with cessation (Health Canada, 2002e).

Magnitude of the Problem in B.C.

Seniors in B.C. have the lowest smoking rate compared to all other age groups. In B.C., 10 percent of senior men and 8 percent of senior women smoke daily compared to 21 percent of for men age 35 to 44 and 14 percent for women age 35 to 44 (BC Stats, 2005). Nevertheless, many seniors are former smokers. Research shows that quit rates are higher among seniors than younger people; however, seniors with long smoking histories often need additional assistance with cessation (Health Canada, 2002e). Evidence shows that older smokers are more likely to be "hard-core" smokers, which are defined as heavy smokers with weak quitting histories who expect to never quit smoking. In general, older smokers have more pessimistic attitudes toward being ready to quit smoking and are less likely to recognize the health risks associated with smoking. Although older smokers are less likely than younger people to attempt quitting, they are more likely to be successful in the attempts (Health Canada, 2002e).

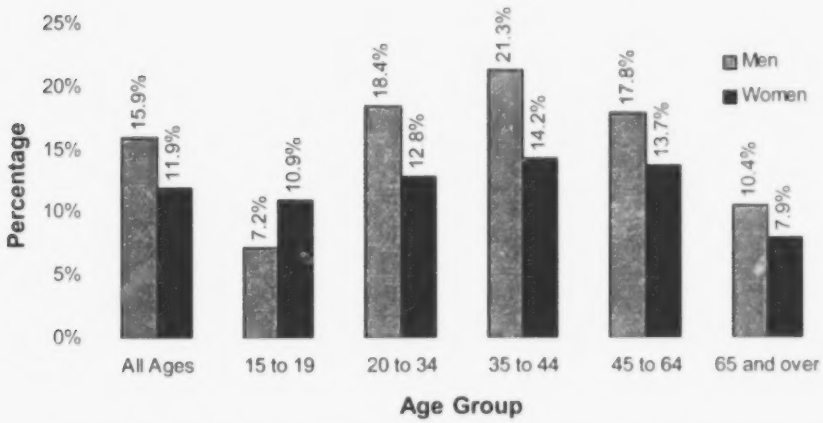
Canadian statistics also show that the number of smoking-related deaths has increased for women. In fact, lung cancer has now replaced breast cancer as the number one cause of cancer deaths among women in many countries where women have been smoking for 30 years or more (Health Canada, 2002e). Figure 10 shows the percentage of people who smoked daily in B.C., in 2003, by age and gender.

Lower smoking rates among seniors may be related to the fact that people die from smoking before they reach older adulthood. Health Canada estimates that smoking will account for more than 50 percent of death before age 70 among today's 15-year-old smokers. On average, smoking is likely to reduce a person's life expectancy by 15 years. Moreover, the mortality rate among current smokers age 65 and over is estimated to be twice that of people that have never smoked (Health Canada, 2002e).

Health Risks Associated with Smoking

There are multiple well-established health risks associated with tobacco use. In 2004, the U.S. Surgeon General's report "The Health Consequences of Smoking" identified smoking as the cause for the diseases and other adverse health effects listed in Table 3.

Figure 10: Percentage Daily Smokers, by Age and Gender, B.C. 2003



Source: (Statistics Canada, Canadian Community Health Survey, Cycle 2.1, 2003).

Table 3: Diseases and Other Adverse Health Effects in Seniors for which Smoking is identified as a cause in current U.S. Surgeon General's 2004 report.

CANCER	CARDIOVASCULAR DISEASES	RESPIRATORY DISEASES	OTHER EFFECTS
• Bladder • Cervical • Kidney • Laryngeal • Lung • Oral • Pancreatic • Stomach	• Abdominal aortic aneurysm • Atherosclerosis • Cerebrovascular disease • Coronary heart disease	• Chronic obstructive pulmonary disease • Acute respiratory illness, such as pneumonia. • Respiratory effects (e.g. coughing, phlegm, wheezing, and dispnea)	•Cataract •Diminished health status / morbidity •Hip fractures •Low bone density / Osteoporosis •Peptic ulcer disease

Source: (U.S. Department of Health and Human Services, 2004).

Benefits of Smoking Cessation in Seniors

Benefits from smoking cessation are seen at any age (Health Canada, 2002e). For example, older smokers decrease their risks for coronary heart disease and stroke

almost immediately after quitting. Furthermore, significant improvement in circulation and pulmonary perfusion occur rapidly after quitting, with most of the improvement occurring in the first year. It is also observed that most of the abnormality in pulmonary epithelial permeability due to smoking is rapidly reversible after quitting (Health Canada, 2002e).

Evidence shows that smoking causes 80 to 90 percent of all emphysema and chronic bronchitis cases. By quitting smoking, seniors can substantially reduce the incidence and progression of chronic obstructive lung diseases. In general, seniors who quit smoking have lower mortality rates, a decreased risk of cardiovascular disease and recurrent myocardial infarctions, lung and other cancers as well as better pulmonary and general physical functioning (Health Canada, 2002e). In short, the message to transmit to older smokers is that *it is never too late to quit smoking.*

Health Care Costs Associated with Smoking

In Canada, economic costs to society from tobacco use were estimated to be between $11 and $15 billion in 1991. Furthermore, tobacco use is estimated to cost between $3 and $3.5 billion a year to the Canadian health care system, with most of the costs associated with hospital care. Again, higher health care costs are associated with older smokers. Therefore, when comparing the potential economic return on investment for smoking cessation strategies, it is safe to say that potential short-term economic benefits are likely to be seen with smoking cessation strategies targeting seniors (Health Canada, 2002e).

Intervention Strategies

The most effective intervention to decrease the risk for smoking-related diseases at all ages, including seniors, is smoking cessation. Multiple quitting aids, including pharmacological treatments, behavioural support programs, counseling, self-help materials or nicotine replacement therapy, have been shown to increase successful quitting rates. When looking at strategies for smoking cessation among seniors, it is important to note that responses to health information messages declines with age. However, this might be due to the fact that information campaigns are usually targeted to younger age groups. A handful of treatment studies specifically examining predictors of quitting success among seniors have confirmed the following factors as beneficial (Health Canada, 2002e):

- Lower nicotine dependence
- Higher quitting self-efficacy
- Level of educational attainment
- Hospitalization for illness diagnosis of smoking-related disease
- Prior quitting success
- Stronger quitting motivation
- Greater perceived quitting barriers
- Use of more quitting strategies
- Having few or no acquaintances who smoke and or a non-smoking spouse
- Frequent contact with physicians and pharmacists for seniors using the nicotine patch.

These predictors can be used for tailoring individual smoking cessation for seniors. Studies have shown that seniors are highly responsive to targeted smoking cessation campaigns. When older smokers decide that they want to quit smoking, they are usually more successful than younger smokers in their attempt. Finally, research on tobacco use in seniors support the argument that it is socially and economically beneficial to implement comprehensive smoking cessation strategies that include seniors (Health Canada, 2002e).

Appendix E: Social Connectedness Evidence

Importance of the Issue

It is recognized that seniors' social participation and integration in society is linked to healthy aging. Social support is an essential ingredient of physical and mental health (Rowe & Khan, 1998). Marriage, friendships, and community ties all appear to increase life expectancy (Adler & Towne, 1999). Seniors with extensive friendship and family networks are more likely to have better appetites, more protein intake and a higher calorie diet (O'Brien Cousins, 1998). Enhancing social support, for instance, by engaging in various activities in the community, correlates with well-being and life satisfaction (Lemme, 1999). Conversely, many seniors find themselves more isolated as they age due to multiple factors, including increased likelihood of living alone, death of family members or friends, retirement or poor health. For example, isolated seniors are two to three times more likely to die prematurely than others who have strong social ties (Adler & Towne, 1999). In addition, social support contributes to higher quality of life, increased life satisfaction and enhanced mental and physical well-being (Lemme, 1999). Indeed, research shows that seniors consistently report relationships and friends as being the second most important determinant of quality of life (Victor et al., 2000).

Magnitude of the Problem in B.C.

In B.C., the majority of seniors report having high levels of social support. Most B.C. seniors report feeling loved and cared for and state having people to confide in, to go to for advice, or count on in a crisis. There is no significant gender difference associated with self-reported levels of social support in seniors. However, seniors living in densely populated areas show lower levels of social support than seniors living in less populated areas (B.C. Ministry of Health Planning, 2003b). In particular, approximately 30 percent of residents in cities are likely to feel lonely or isolated. As shown in Figure 11, most seniors report having multiple close friends and relatives. An estimated 3,582 men and 4,641 women, or more than 8,000 seniors do not have friends or relatives to turn to for support (B.C. Ministry of Health Services, 2004).

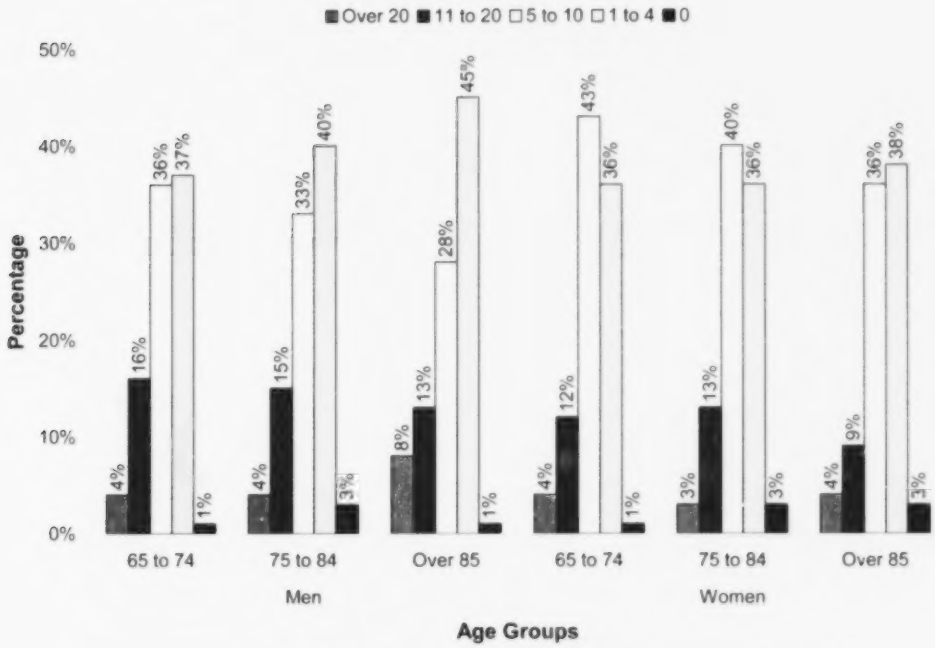
Risk Factors For Social Isolation and Loneliness

Several risk factors have been linked to social isolation and loneliness, including poor health and disabilities, being a women, having lost a spouse, living alone, reduced social contact with family and friends, being older, driving cessation, and living in urban areas (Hall & Havens, 1999). These risk factors are interrelated and the presence of more than one risk factor further increases the risk of loneliness and social isolation. It is also important to note that there are no cause and effect relationships between the risk factors and loneliness, but a simple correlation. In this way, it is often difficult to capture the direction of the relationships between the risk factors and social isolation.

The Effects of Seniors' Social Isolation and Loneliness

Social isolation for seniors is associated with higher levels of depression and disability associated with chronic diseases, increased rates of premature death, and decreased overall well-being (WHO, 2003). Other research has found that socially isolated and lonely seniors are at increased risk for nursing home placement. However, it is difficult to understand if loneliness precedes poor-health or if poor health results in increased loneliness (Hall and Havens, 1999).

Figure 11. Number of Close Friends and Relatives by Age and Gender Reported by B.C. Seniors in 2001.



Source: (Statistics Canada, Canadian Community Health Survey: Cycle 1.1, 2000/2001).

Benefits of Social Support

Social support can be defined as "information leading one to believe that he or she is cared for, loved, esteemed, and a member of a network of mutual obligations" (Rowe & Khan, 1998). In this way, social support protects people from many damaging effects of stressful life events, including a lower risk of arthritis, tuberculosis, depression, and alcoholism. Furthermore, studies have shown that strong social support is associated with the need for less pain medication after surgery, better recovery time, and better medication compliance (Rowe & Khan, 1998). Social support and contact through a telephone conversation, visit of a family member, a friend or a neighbour, participation in religious groups, and attendance at meetings of an organization are all related to healthy aging. An index of well-being including involvement in productive activity, emotional and mental status, and functional levels demonstrated that the frequency of visits with friends and frequency of attending meetings of organizations were the two strongest predictors of well-being for seniors (Rowe & Khan, 1998). Most importantly, the more meaningful an activity is, the greater its positive impacts on health.

Volunteering

Many British Columbian seniors contribute to society though volunteering. Seniors make up 9 percent of the total volunteer force but contribute 18 percent of all volunteer hours

in B.C. (B.C. Ministry of Community Services, 2005). In 1997, 58 percent of Canadian seniors participated in at least one informal volunteer activity. Although some may argue that it is impossible to quantify seniors' volunteer contributions, it is now recognized as an integral part of our economy (Robb et al., 1997). Seniors volunteer for various reasons, including enhancing social contacts, fulfilling a need for affiliation, to feel productive and useful, and to contribute to the health and functioning of their communities (Chappell, 1999). In this way, volunteering bring seniors the benefits associated with increased social contact, while it also fosters healthy functioning of their community. Socially isolated seniors are unlikely to participate in volunteering activities. Not only would isolated seniors benefit from volunteering; but their community would also greatly benefit from their valuable contributions.

Intervention Strategies

In March 2004, the Healthy Children, Women and Seniors Branch of the B.C. Ministry of Health Services undertook a literature review on social isolation to better understand the issue. The review identified a number of key initiatives that could potentially decrease social isolation:

- Supporting transporting initiatives.
- Exploring remote communications (e.g. internet and telephone) as tool to reduce isolation.
- Increasing community awareness of services for seniors.
- Supporting informal caregivers.
- Increasing the capacity of small service organizations.
- Developing volunteer based outreach programs.

Before implementing any intervention, it is critical to know the needs of the targeted population. No single kind of support is universally beneficial (Rowe and Khan, 1998). Instead, to ensure an intervention is effective, it is important that the type of supportive actions depend on the situation and individual need. Unwanted support or the wrong kind of support may lead seniors to feel a loss of independence or decreased self-esteem and privacy (Smith et al., 1994; Rowe & Khan, 1998).

References

Adler, B.R., & Towne N. (1999). Looking out, looking in (9th Ed.). Forth Worth: Harbour Brace College.

B.C. Ministry of Community Services (2005). Quick Facts About Seniors in British Columbia. Retrieved October 3, 2005, http://www.mcaws.gov.bc.ca/seniors/premiers_council/seniors_factsheet.htm)

B.C. Ministry of Health (2005a). From Dialogue to Action: Summary Report of the Working Group and Framework for Change. Victoria, B.C.: B.C. Ministry of Health.

B.C. Ministry of Health (2005b). Ministry of Health 2005/2006 – 2007/2008 Service Plan Update, September 2005. Victoria, B.C.: B.C. Ministry of Health.

B.C. Ministry of Health, (2005c) Health Data Warehouse (retrieved July 22, 2005).

B.C. Ministry of Health (2005d). Levy-Milne, R. British Columbia Nutrition Survey: Report on Seniors' Nutritional Health. Victoria, B.C.: B.C. Ministry of Health.

B.C. Ministry of Health Planning (2003a), Foundations for Directional Planning – Component 1: Industry Analysis. Prepared by Bearing Point, Conference Board of Canada. Victoria, B.C.: B.C. Ministry of Health Planning.

B.C. Ministry of Health Planning. (2003b). *A Report on the Health of British Columbians: Provincial Health Officer's Annual Report 2002.*

B.C. Ministry of Health Services (2004). A Profile of Seniors in British Columbia. Victoria, B.C.: B.C. Ministry of Health Services.

B.C. Ministry of Health Services, Population Health and Wellness Division (2005). Population Health and Wellness Service Plan 2005/2006: Strategic Investments in Public Health. Victoria, B.C.: B.C. Ministry of Health Services.

BC Stats, B.C. Ministry of Management Services (2005). Source P.E.O.P.L.E. 30 Population Projections.

Broemeling, A-M. (2004). Chronic Conditions and Co-morbidity Among Residents of British Columbia. Paper presented at the Ministry of Health Services Policy Round, November 23, 2004.

Canadian Fitness and Lifestyle Research Institute. (1998). 1997 Physical activity Benchmarks – Report. Canadian Fitness and Lifestyle Research Institute.

Chappell, N. (1999). Volunteering and Healthy Aging: What We Know. Commissioned by Volunteer Canada and Manulife Financial. Retrieved January 2004 from http://www.coag.uvic.ca/publications/research/pdfs/report10.pdf

Chappell, N. Gee, E. McDonald, L. and Stones, M. (2003). Aging in Contemporary Canada. Prentice Hall: Toronto.

Diet and Cancer. (1993). American Council on Science and Health, New York, New York.

Dietitians of Canada. (1998). *Eat Well, Live Well...For a Lifetime!* A Resource Manual for Health Professionals.

Flynn, M. A. W. Irvin, and Krause, G. (1994). The effect of folate and cobalamin on osteoarthritic hands. *Journal of the American College of Nutrition.* 13(4), 351-356.

Guralnik, J.M., Alecxih, L, Branch, L.G. & Wiener, J.M. (2002). Medical and Long-term care cost when older persons become more dependent. *American Journal of Public Health*, 92(8), 1244-1245.

Hall, M. & Havens, B. (1999). The effect of Social Isolation and Loneliness on the Health of Older Women. Aging in Manitoba Study. Department of Community Health Sciences. University of Manitoba.

Hamilton, N. & Bhatti, T. (1996). Population Health Promotion: An integrated model of population health and health promotion. Ottawa: Health Promotion Development Division.

Health Canada (1998). Principles of the National Framework on Aging: A Policy Guide. Division of Aging and Seniors. Minister of Public Works and Government Services, Canada.

Health Canada. Division of Aging and Seniors (2002a). Dare to Age Well: *Workshop on Healthy Aging. Part1: Aging and Health Practices.* Works and Government Services, Canada.

Health Canada. Division of Aging and Seniors (2002b). "Healthy Aging: Nutrition and Healthy Aging: Ministry of Public Works and Government Services, Canada.

Health Canada. Division of Aging and Seniors (2002c). Healthy Aging: Prevention of Unintentional Injuries Among Seniors. Minister of Public Works and Government Services, Canada.

Health Canada. Division of Aging and Seniors (2002d). *Physical Activity and Older Adults.* Minister of Public Works and Government Services Canada.

Health Canada. (2002e). *Tobacco Use and Smoking Cessation Among Seniors.* Minister of Public Works and Government Services, Canada.

Khaw, K. (1997). Healthy aging. British Medical Journal, 315 (7115), 1090-1097.

Laditka, J.N. (2001). Providing behavioral incentives for improved health in aging and medicare cost control: A policy proposal for universal medical savings accounts. *Journal of Health and Social Policy,* 13(4), 75-90.

Lemme, B. H. (1999). Development in Adulthood. (2 Ed). Boston: Allyn and Bacon.

Leslie, M. & St. Pierre, W. R. (1999). Osteoporosis: Implications for risk reduction in the college setting. Journal of American College Health, 48 (2), 67-71.

Levine, L.S. & Idler, E.L. (1981). *The hidden health care system: Mediating structures and medicine.* Cambridge, MA: Ballinger.

McCormack, P. (1997). Undernutrition in the elderly population living at home in the community: a review of the literature. *J. Adv. Nurs,* 26(5), 856-863.

National Advisory Council on Aging. (2004a). Successful aging. *Bulletin of the National Advisory Council on Aging, 17*(4), 1-8.

National Advisory Council on Aging. (2004b). Eat well to age well. *Bulletin of the National Advisory Council on Aging,* 17(3), 1-8.

National Advisory Council on Aging. (2005). Seniors on the Margins: Seniors from Ethnocultural Minorities. Government of Canada. Ottawa, Ontario

National Task Force on the Prevention and Treatment of Obesity (2000). Overweight, obesity and health risk. *Arch Intern Med,* 160, 898-904.

O'Brien Cousins, S. (1998). *Promoting Active Living and Healthy Eating Among Older Canadian.* Determinants of Health: Adults and Seniors. National Forum on Health. Ottawa: Editions MultiMondes, 156.

Pratt, L. (1976). *Family structure and effective health behavior.* Boston: Houghton Mifflin.

Robb, R., Denton, M., Gafni, A., Joshi, A., Lian, J., Rosenthal, C. & Willison, D. (1997). Evaluation of Unpaid Help by Seniors in Canada: An Empirical Analysis. IESOP Research Paper No. 27. http://socserv.mcmaster.ca/iesop/abstracts/abst27.htm

Rowe, J. W. and Khan, R.L. (1998). *Successful Aging.* Pantheon: New York.

Rubenstein, L., Stevens, J. & Scott, V., *unpublished.* Preventing Falls Among Older Adults, Chapter in U.S. Center for Disease Control Handbook on Injury and Violence Prevention Interventions

Scott, V. (2000). Study of factors associated with fall-related injuries among older Canadians. Doctoral dissertation, University of Victoria, Faculty of Human and Social Development.

Scott, V. S. Peck and P. Kendall. (2004). *Prevention of falls and injuries among the elderly: A special report from the Office of the Provincial Health Officer.* Victoria, B.C.: Ministry of Health Planning.

Shapiro, J. A. et al. (1996). Diet and rheumatoid arthritis in women: a possible protective effect of fish consumption. *Epidemiology,* 7 (3), 256-264.

Smith, C. Fernengel, K. Holcroft, C. & Gerald, K. (1994). Meta analysis of the associations between social support and health outcomes. *Journal of Behavioural Medicine,* 16(4), 352-362.

Statistics Canada. (2003). Canadian Community Health Survey, Cycle 2.1, 2003

Statistics Canada. (2004). Canadian Community Health Survey, Cycle 2.2, Nutrition 2004.

The Legislative Assembly of British Columbia. (2004). *The Path to Health and Wellness: Making British Columbian Healthier by 2010.* Select Standing Committee on Health. First Report. Fifth Session, Thirty-Seventh Parliament.

United Nations General Assembly. (1991). United Nations Principles for Older Persons. Office of the United Nations High Commissioner for Human Rights. Retrieved July 15, 2005, http://www.ohchr.org/english/law/olderpersons.htm

U.S. Surgeon General's Report (2004). *The Health Consequences of Smoking: A Report of the Surgeon General.* United States Department of Health and Human Services. Retrieved on December 6, 2004, http://www.cdc.gov/tobacco/sgr/sgr_2004/pdf/executivesummary.pdf

Victor, C., Scrambler, S., Bond, J. & Bowling, A. (2000). Being alone in later life: Loneliness, social isolation and living alone. *Reviews in Clinical Gerontology,* 10, 441-469.

World Health Organization (WHO). (1986). The Ottawa Charter for Health Promotion, Health Promotion, 1(1), 1–5.

World Health Organization (WHO) (2002). Active Ageing: A Policy Framework.

World Health Organization (WHO) (2003). *The Social Determinants of Health: The Solid Facts-Second Edition.*

Yen, P. K. (1998). Stopping heart disease with diet. *Geriatric Nursing,* 19, 50-51.

BRITISH
COLUMBIA

Ministry of Health

Health and Seniors' Information Line
Toll-free in B.C.:

1-800-465-4911